cracking of the liquid polymer was then studied in the temperature range 670 to 750 K. At the latter temperature the rate of hydrocracking was at least 10^5 times greater than at 500 K. The products of hydrocracking once again included CH_4, C_2H_4 and C_2H_6, but now for each of these gold was the most effective catalyst. Its total activity was more than twice that of platinum, which as Figure 3 shows was still a reasonably effective catalyst itself. After cooling, the polymer heated under these conditions was found to consist of rosettes at the centre of which was either a particle of gold or platinum.

Thus gold because of its lower adsorptive capacity became the more effective hydrocracking catalyst.

Conclusion

However, these and other results may be open to criticism since it has not been possible to determine the surface area of gold and hence to compare the turnover numbers for gold and other metals in these reactions.

Approximately three years ago we were surprised to find even meagre activity for gold in hydrogenation and related reactions; now we must be encouraged further to note that in certain reactions and conditions gold shows activity which is significantly greater than that shown by the transition metals which are generally accepted as the more traditional catalysts.

We may not share all the optimism of the Greek poet and playwright Diphilus expressed in "nothing is more powerful than gold" (10), but we are hopeful of achieving further interesting and useful advances in our knowledge of the catalytic properties of gold.

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A Rhenium-Gold Contact Alloy for Sensitive Relays

In a search for a contact material for extremely sensitive relays and electrical measuring instruments, Russian workers have settled on an alloy of gold containing 3 per cent rhenium. The alloy formerly used in this type of relay was a gold alloy with 30 per cent palladium and 10 per cent platinum, this being in the form of 0.15 mm diameter wire moving between two freely suspended fixed contacts of the same material and also in the form of fine wire. Contact is thus made between two intersecting cylindrical surfaces, but in the cases in question the contact pressure was minute, varying from only 0.0001 to 0.001 gram. In these very difficult conditions even normal atmospheric humidity or contamination can adversely affect contact performance.

Gold was considered to be the only possible basis metal for a suitable contact alloy, but increased mechanical strength was desirable as well as complete resistance to organic vapours or other types of pollution. A series of alloying elements including titanium, cobalt, indium and zinc was investigated, but additions of rhenium proved to give optimum results.

This work, reported in a paper by A. M. Chernyavskaya, E. P. Razgulyaev and S. A. Telezhkin presented at a conference on rhenium held in Moscow some time ago but only recently published (*Issled. Primen. Splavov Reniya, Dokl. Vses. Soveshch. Probl. Reniya*, 1975, 182–185) included the determination of resistivities, contact resistances, mechanical properties and thermoelectric effect against copper of alloys with 1, 2, 3 and 4 per cent rhenium.

The resistivities naturally increased by comparison with pure gold, but were much lower than with the gold-palladium-platinum alloy, while the thermal e.m.f. against copper was also very much lower.

All four alloys were found to have considerably lower and more stable contact resistances and to be appreciably less liable to sticking over a range of currents up to 200 milliamp, but the 3 per cent alloy gave the best values, with a contact resistance lower by a factor of 5 to 10 compared with the gold-palladium-platinum alloy, as well as a much greater resistance to deformation.

After these initial tests a number of relays fitted with contacts in 3 per cent rhenium-gold were submitted to extensive industrial testing and found to give a distinct improvement by comparison with those having the older gold-palladium-platinum alloy contacts.

S.H.